

# **ET375T**

## **C Programming in Linux**

### **[Onsite]**

#### **Course Description:**

Students will have the opportunity to program in the C language running in the Linux operating environment. Emphasis is on problem solving, structured programming style and documentation. Instruction on the use of debugging techniques is also included.

#### **Prerequisite(s) and/or Corequisite(s):**

Prerequisite: An introduction to computer programming course or a microprocessors and industrial applications course or equivalent

**Credit hours: 4**

**Contact hours: 60 (36 Theory Hours, 24 Lab Hours)**



# STUDENT SYLLABUS: C PROGRAMMING IN LINUX

Instructor: \_\_\_\_\_

Office hours: \_\_\_\_\_

Class hours: \_\_\_\_\_

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## Major Instructional Areas

### Unit 1

#### Chapter 0: Introduction to Linux and C Programming

- Introduction to the Linux Environment: commands needed and file operations
- Need for Data Types
- Classical Program Structures

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### Unit 2

#### Chapter 1: An Overview of C

- Components of a C Program
- Character sets
- Functions in C
- Compiling a C program
- More information on Linux: editing and compiling

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### Unit 3

#### Chapter 2: Understanding Lexical Elements, Operators, and the C System

- Need for Simple Data Types
- Integer Data Type

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### Unit 4

### **Chapter 3: The Fundamental Data Types**

- Character Data Type
  - Input and output of integers and characters
  - Floating Point Data Type
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## **Unit 5**

### **Chapter 4: Flow Control**

- Conditional Execution
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## **Unit 6**

### **Chapter 5: Functions**

- Iteration
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## **Unit 7**

### **Chapter 6.1 to 6.9: Arrays, Pointers, and Strings**

- User-defined functions
  - Recursive functions in C
  - Scope of variables in C functions
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## **Unit 8**

### **Chapters 6 and 7: Pointers**

- Pointers
  - Pointer declarations
  - Working with pointers
  - Pointers and functions
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## **Unit 9**

### **Chapters 9.1 - 9.7 and 10.1 - 10.5: Structures, Unions, and List Processing**

- Need for Arrays and structures
- Arrays in C and their relation to structures in C

- Unions and intersections
- List Processing

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## Unit 10

### Chapter 11: Input/Output Need for persistent storage

- Opening and closing a data file
- Formatted file I/O operations
- Error Handling
- Character I/O operations

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## Unit 11

### Final Examination

- Review session
- Final examination

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## Course Objectives

Upon successful completion of this course, the student will be able to:

1. Identify the need for structured programming.
2. List the features of a structured programming language.
3. Use the Linux environment needed for C programming
4. Define the functions used in a C program.
5. Use the standard C library in a program.
6. Identify the use of logical operators in a program.
7. Identify the use of the input and output data types in a program.
8. Define the character constants in a C program.
9. List the functions of floating point constants.
10. Identify the use of conditional executions in a program.

11. Identify the use of iterations in a program.
12. Describe the user-defined functions.
13. Define a pointer.
14. Identify the role of pointer operations.
15. List the various storage classes.

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## Student Textbook

- Kelley, AI and Ira Pohl. A Book on C, from 4<sup>th</sup> ed., Pearson Custom Publishing, 2004.

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## Course Schedule

Unit	Topic (Lecture Period)	Lab and Other Coverage
1	Starting from Zero Linux commands and file operations	
2	An Overview of C Linux text editor and C compiler	Lab, Homework Exercises
3	Lexical Elements, Operators, and the C System	Lab, Homework Exercises
4	The Fundamental Data Types	Lab, Homework Exercises
5	Flow of Control	Lab, Homework Exercises
6	Functions	Lab, Homework Exercises
7	Arrays and Pointers	Lab, Homework Exercises
8	Strings and Bitwise Operators and Enumeration Types	Lab, Homework Exercises

9	Structures and Unions	Lab, Homework Exercises, Project
10	Input/Output	Lab, Homework Exercises, Project
11	Final Term Examination	Review session:  The final examination will be based on the content covered in Units 1 through 10.

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## Evaluation Criteria and Grade Weights

Homework Exercises:	25%
Lab Exercises:	30%
Final exam:	25%
Project and Quiz:	20%

Final grades will be calculated from the percentages earned in class as follows:

A	90 - 100%	4.0
B+	85 - 89%	3.5
B	80 - 84%	3.0
C+	75 - 79%	2.5
C	70 - 74%	2.0
D+	65 - 69%	1.5
D	60 - 64%	1.0
F	<60%	0.0